CO AND CH4 COLUMN RETRIEVAL FROM THE SCANNING HIGH RESOLUTION INTERFEROMETER SOUNDER (S-HIS)

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INTRODUCTION

In the ongoing effort to understand the composition, chemistry, and distribution of pollutants in the troposphere, it is important to have accurate measurements of gases such as Carbon Monoxide (CO) and Methane (CH4). Historically, aircraft measurements have provided spatial coverage of CO and CH4 in the region of interest, but with limited spatial resolution. The Scanning High Resolution Interferometer Sounder (S-HIS, Vinson et al. 1998) has been developed by the University of Wisconsin to provide carbon column optical depth measurements from nadir looking aircraft observations. The S-HIS is a modified version of the University of Wisconsin Scanning HIS instrument (SSEC) used in the NASA SAFARI mission during aircraft field experiments (Vinson et al. 1998). The S-HIS instrument is specifically designed to measure CO and CH4 columns from nadir looking aircraft observations. It is a new technique that has been developed to derive trace gas column optical depth, total column amount, and mixing ratio from high spectral resolution upwelling infrared emission spectra. The technique has been applied to accurately calibrated observations of the University of Wisconsin Scanning HIS instrument. Results have been presented showing a doubling of carbon monoxide optical depth over controlled fires observed by the S-HIS on the NASA ER-2 during the NASA SAFARI experiment. Carbon Monoxide mixing ratios have also been shown from flights over both the eastern and western coast of southern Africa. Future work includes validation of this technique and extension of it to the EOS AIRS instrument on the Aqua spacecraft.